UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

CC

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/403,269	10/18/99	ULF L	003300-589

HM22/0619

BENTON S DUFFETT JR
BURNS DOANE SWECKER & MATHIS
PO BOX 1404
ALEXANDRIA VA 22313-1404

EXAMINER	
STEADMAN, D	
ART UNIT	**PAPER NUMBER**
1652	10

DATE MAILED: 06/19/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No.	Applicant(s)	
	09/403,269	ULF ET AL.	
	Examiner	Art Unit	
	David J. Steadman	1652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1, 2, and 4-20* is/are pending in the application.

4a) Of the above claim(s) *8, 19, and 20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 2, 4-7, and 9-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☐ Notice of References Cited (PTO-892)
16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 .
18) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
19) ☐ Notice of Informal Patent Application (PTO-152)
20) ☐ Other: .

DETAILED ACTION

Status of the Application

Claims 1, 2, and 4-20 are pending in the application.

Claims 1, 2, 4-7, and 9-18 have been examined on the merits.

Applicant's election with traverse of Group I, drawn to an isolated DNA encoding, expression vectors and host cells for expressing, and a process for using said host cells for the manufacture of a glucuronyl C5-epimerase, cancellation of claim 3, and amendment of claims 1, 2, and 10 in Paper No. 9, filed 05/17/01 is acknowledged.

The traversal is on the grounds that during review by the International Searching Authority (ISA), the claims of the PCT application (PCT/SE98/00703) were not found lacking unity, and therefore the current restriction requirement "runs afoul" of Article 27 and is improper. This is not found persuasive because the United Sates Patent and Trademark Office is not bound by the lack of unity determination by another ISA. 37 C.F.R. 1.484 indicates that the international preliminary examination is a non-binding opinion. Additionally, 37 C.F.R. 1.499 states that, if the Examiner finds that a national stage application lacks unity of invention under 37 C.F.R. 1.475, the Examiner may in an Office action require the applicant in the response to that action to elect the invention to which the claims shall be restricted. Thus, the determination of lack of unity is proper under the PCT treaty.

The requirement is still deemed proper and is therefore made FINAL.

Claims 8, 19, and 20 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention, the requirement having been traversed in Paper No. 9.

Specification/Informalities

1. It is suggested that lines 15 and 16 of the specification be replaced with "Brief Description of the Figures"

2. The Raw Sequence Listing was modified by the Office to correct an obvious error for entry into the sequence database. The modification was an insertion of a "hard return" in SEQ ID NO:9.

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed, for example "DNA Sequence Encoding a Human Glucuronyl C5-Epimerase".

Claim Objections

4. Claims 10, 12, 15, and 18 are objected to under 37 CFR 1.75 as being substantial duplicates of claims 4-7. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

5. If claim 1 is meant to be interpreted as limited to nucleotides 1 to 1404 of SEQ ID NO:12 (see Office action part 9. below), claim 2 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1, 2, 4-7, and 9-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. In the present instance, claim 1 (claims 2, 4-7, and 9-18 dependent thereon) recites the broad recitation "mammalian", and the claim also recites "human" which is the narrower statement of the range/limitation. It is suggested that the term "coding for a mammalian, including human, glucuronyl" be replaced with, for example, "coding for human glucuronyl".

8. Claims 1 (claims 4-7, 10, 12, 13, 15, 16, and 18 dependent thereon) and 2 (claims 9, 11, 14, and 17 dependent thereon) are rejected because of the recitation of "a nucleotide sequence comprising nucleotide residues 1 to 1404, inclusive, as depicted in the sequence listing" in claim 1 or "a nucleotide sequence comprising nucleotide residues 73 to 1404, inclusive, as depicted in the sequence listing" in claim 2 as it is unclear as to the specific sequence referred to by Applicants. It is suggested that Applicants replace the term with, for example, "a nucleotide sequence comprising nucleotide residues 1 to 1404 of SEQ ID NO:12" for claim 1 or "a nucleotide sequence comprising nucleotide residues 73 to 1404 of SEQ ID NO:12" for claim 2.

9. Claim 1 (claims 2, 4-7, and 9-18 dependent thereon) is indefinite in the recitation of "glucuronyl C-5 epimerase, or a functional derivative thereof... ...constituted by a nucleotide sequence comprising nucleotide residues 1 to 1404" as it is unclear as to whether the scope of the encoded glucuronyl C-5 epimerase recited in the claim is limited to a glucuronyl C-5 epimerase encoded by nucleotide residues 1 to 1404 of SEQ ID NO:12 or if the scope of the claims includes any functional derivative of a glucuronyl C-5 epimerase. It is suggested that Applicants clarify the scope of their claimed subject matter.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

10. Claims 1, 4-7, 10, 12, 13, 15, 16, and 18 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 1 (claims 4-6, 10, 12, 13, and 15 dependent thereon), 7, 16, and 18 are rejected because the claims recite a DNA sequence encoding a mammalian glucuronyl C5-epimerase or a functional derivative thereof or processes for using a polynucleotide for the manufacture of a glucuronyl C5-epimerase or a functional derivative thereof. The specification teaches the structures of only two representative species of nucleic acids encoding a glucuronyl C5-epimerase, i.e., nucleotides 73-1404 or 1-1404 of SEQ ID NO:12. The specification fails to disclose any other nucleic acids encoding a mammalian glucuronyl C5-epimerase by any

identifying structural characteristics or properties other than the functionality of encoding a mammalian glucuronyl C5-epimerase. Given the lack of description of additional representative species of nucleic acids encoding a mammalian glucuronyl C5-epimerase as encompassed by the genus of the claims, Applicants have failed to sufficiently describe the claimed invention, in such full, clear, concise and exact terms that a skilled artisan would recognize that Applicants were in possession of the claimed invention.

11. Claims 1, 4-7, 10, 12, 13, 15, 16, and 18 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for polynucleotides comprising nucleotides 73-1404 or 1-1404 of SEQ ID NO:12 or processes for using said polynucleotides for the manufacture of a glucuronyl C5-epimerase, does not reasonably provide enablement for a DNA sequence encoding any mammalian glucuronyl C5-epimerase or a functional derivative thereof or processes for using a polynucleotide for the manufacture of any mammalian glucuronyl C5-epimerase or a functional derivative thereof. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

Claims 1 (claims 4-6, 10, 12, 13, and 15 dependent thereon), 7, 16, and 18 are so broad as to encompass a polynucleotide encoding <u>any</u> functional derivative of <u>any</u> mammalian glucuronyl C-5 epimerase. The scope of the claims is not commensurate with the enablement provided by the disclosure with regard to the extremely large number of polynucleotides encoding mammalian glucuronyl C-5 epimerases and derivatives thereof broadly encompassed by the claims. Since the amino acid sequence of a protein determines its structural and functional

properties, predictability of which changes can be tolerated in a protein's amino acid sequence and obtain the desired activity requires a knowledge of and guidance with regard to which amino acids in the protein's sequence, if any, are tolerant of modification and which are conserved (i.e. expectedly intolerant to modification), and detailed knowledge of the ways in which the proteins' structure relates to its function. However, in this case the disclosure is limited to polynucleotides comprising nucleotides 73-1404 or 1-1404 of SEQ ID NO:12 or processes for using said polynucleotides for the manufacture of a glucuronyl C5-epimerase.

While recombinant and mutagenesis techniques are known, it is not routine in the art to screen for multiple substitutions or multiple modifications, as encompassed by the instant claims, and the positions within a protein's sequence where amino acid modifications can be made with a reasonable expectation of success in obtaining the desired activity/utility are limited in any protein and the result of such modifications is unpredictable. In addition, one skilled in the art would expect any tolerance to modification for a given protein to diminish with each further and additional modification, e.g. multiple substitutions.

The specification does not support the broad scope of the claims which encompass all modifications and fragments of any mammalian glucuronyl C-5 epimerase gene because the specification does not establish: (A) regions of the protein structure which may be modified without affecting glucuronyl C-5 epimerase activity; (B) the general tolerance of glucuronyl C-5 epimerase to modification and extent of such tolerance; (C) a rational and predictable scheme for modifying any glucuronyl C-5 epimerase residues with an expectation of obtaining the desired biological function; and (D) the specification provides insufficient guidance as to which of the essentially infinite possible choices is likely to be successful.

Thus, applicants have not provided sufficient guidance to enable one of ordinary skill in the art to make and use the claimed invention in a manner reasonably correlated with the scope of the claims broadly including a polynucleotide encoding any functional derivative of any mammalian glucuronyl C-5 epimerase. The scope of the claims must bear a reasonable correlation with the scope of enablement (In re Fisher, 166 USPQ 19 24 (CCPA 1970)). Without sufficient guidance, determination of having the desired biological characteristics is unpredictable and the experimentation left to those skilled in the art is unnecessarily, and improperly, extensive and undue. See In re Wands 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988).

Conclusion

12. No claim is in condition for allowance.

13. Claims 1, 2, 4-7, and 9-18 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, first and second paragraphs, set forth in this Office action.

Certain papers related to this application may be submitted to Art Unit 1652 by facsimile transmission. The FAX number is (703) 308-4242. The faxing of such papers must conform with the notices published in the Official Gazette, 1156 OG 61 (November 16, 1993) and 1157 OG 94 (December 28, 1993) (see 37 CFR 1.6(d)). NOTE: If Applicant submits a paper by FAX, the original copy should be retained by Applicant or Applicant's representative. NO DUPLICATE COPIES SHOULD BE SUBMITTED, so as to avoid the processing of duplicate papers in the Office.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Steadman, whose telephone number is (703) 308-3934. The examiner can normally be reached Monday-Friday from 8:00 am to 4:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ponnathapura Achutamurthy, can be reached at (703) 308-3804. Any inquiry of a general nature or relating to

the status of this application or proceeding should be directed to the Art Unit receptionist whose telephone number is (703) 308-0196.

David J. Steadman

Rebecca Prouty
REBECCA E. PROUTY
PRIMARY EXAMINER
GROUP ~~1800~~ 1600